

OSA - 4076-66.

13 October 1966

To: [REDACTED]

Subject: LIFE SUPPORT EQUIPMENT AGENDA

Dear [REDACTED]

The following items represent my understanding of the decisions reached in the meeting held in your office on 7 October.

I. PRESSURE SUIT MODIFICATIONS

- A. Increase Suit Flotation to provide higher flotation and insure face up position in the water.

A temporary solution of this problem is to be made by [REDACTED] at [REDACTED]. He will fasten two LPU's to the parachute harness with a zippered flap for easy removal in the water.

The permanent fix to this problem is to be the added flotation provided as part of the suit by [REDACTED]. This will probably take the form of a tightly wrapped stole around the back of the pilot's neck and down the front below the chest harness strap. This added flotation must be such that it provides face up flotation positively under all conditions.

- B. Provide dual flotation means for reliability.

This will be implemented by using one CO₂ charge for the basic suit flotation now installed and a second CO₂ charge for the new flotation being provided by [REDACTED].

- C. Provide automatic CO₂ valves to actuate both flotation systems when pilot enters water.

These automatic CO₂ valves are being developed at [REDACTED] and will be provided to actuate both flotation systems independently of each other. Manual back up means are also provided.

On file USAF release
instructions apply.

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- D. Manual access to CO₂ valves such that either hand can actuate.

The two CO₂ valves will be located left and right of the center zipper, above the lap belt area and between the vent valve and the suit regulator such that either hand can actuate either one or both.

- E. Add reinforcement to primary vest in areas subject to damage.

This is being accomplished as a Service Bulletin from [REDACTED]

- F. Provide grommets holes in suit pockets for water drainage.

[REDACTED] To help the pockets drain water, the flaps over the grommets are to be removed. More grommets are to be added to the pockets to facilitate the water draining out more quickly.

To provide water drainage from the bottom of the legs, they are to be made with open cuffs such that they are held in place at the top of the boots with lacing only and a cover flap will then go over the outside of the lacing and down under the top of the boot.

- G. Access to oral inflation to be improved.

This will be accomplished by [REDACTED] as a part of his overall suit improvement.

- H. Remove CO₂ valve feature that prevents oral inflation from being used until the CO₂ valve is actuated.

[REDACTED] is to accomplish tests in his chamber to determine that this CO₂ valve feature is not required. This is desirable in an effort to simplify the CO₂ valving system and make it more reliable for the emergency bail out condition.

The desired end result here is to eliminate any CO₂ valve complication and to eliminate the clip that is presently used in the oral inflation tube such that there is no secondary action required by an

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[REDACTED] unconscious man when the automatic CO₂ valve operates. If there is any slight inflation of the flotation cavity due to altitude conditions this can be bled off by the pilot pushing down on the oral inflation valve which should be easily acceptable after accomplishing Item G.

- I. Add tab to knife pocket for easier access and opening.

This has been accomplished at [REDACTED]

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- J. Latch to be incorporated on left side of helmet to positively mechanically latch visor in closed position until released by pilot.

This latch is in process by [REDACTED] and he expects a prototype to be available for evaluation before 15 November.

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We should note here that because of the bulk of the latch that a slight amount of adaptability is lost because now the sun shade can not be down in place if the visor is up. The addition of the latch means that the sun shade is usable only when the visor is down and latched in place.

- K. Incorporate guards over helmet actuating knobs to prevent damage or actuation during cockpit emergency or ejection.

To incorporate a reasonable fix to guard the helmet actuating knobs requires more rework to the helmets than is practical. [REDACTED] new helmet is of such a shape that it lends itself to providing guarded areas for the helmet actuating knobs. [REDACTED] proposal is that he would like to provide this feature on any new helmets that he builds or as the old helmets require complete refurbishing which he expects to be required since they are getting pretty old. A definitive proposal on this will be submitted in thirty days.

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Other than that, we agreed to forego these guards on the helmets at this time since an improved lap belt will also alleviate this situation by holding the man down in the seat.

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- L. Provide batteries and wiring for face plate defogging during parachute descent.

We will provide batteries and wiring to do this function and will make the system such that the batteries only are wired to the face plate for heating upon seat ejection. We are to determine the battery size and shape and coordinate with [] for volume and stowage of the batteries in the parachute, probably directly below the oxygen pan.

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- M. Study feasibility of heating gloves during parachute descent.

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At present this is only to be a study by [] to explore the possibility of making such gloves. These additions are in no way to compromise the present handling problems that the pilots have in the cockpit with their present gloves.

- N. Modify parachute chest strap buckle to make adjustment possible during parachute descent and life vest inflation.

[] working through [] was to provide these chest straps with a buckle strap feature made to drawings that we supplied.

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- O. Modify oxygen fittings into pressure suit controller to eliminate vulnerability of silver brazed design.

We are supplying twelve sets of these fittings for incorporation of the hoses through Firewel and Darling. These should be available to [] by 15 November.

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Since there will be something like 80 - 100 of these fittings required for hose incorporation to satisfy the requirements of [] pressure suits and shirt sleeve equipment, the remaining fittings are to be made by Firewel. They are proposing to heliarc the hose stub onto the fitting which looks feasible although we will run a detailed stress analysis of this particular feature and report on whether or not it is satisfactory.

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Before we would use any new fitting for flight use we are to insert these strengthened hose fittings into a used regulator and apply loads in order to determine where the next weakest point in the system is. We will first apply loads to the present brazed fittings

and determine at what point they are breaking. We will then apply loads to the strengthened fittings to determine what advantage is gained by making them in this manner and to be sure that the regulator housing itself can sustain fairly high impact loads on the new fittings.

P. Provide smooth guard over suit controller.

We are to provide the guard over the suit controller and will be certain that [] gets our first prototype so that it can be checked for pressure drop across the controller. The design of this guard affects the type of loads that we apply in Item O to the oxygen hose fittings since the guard is eliminating some types of loads that can be applied.

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Q. Improve GFE Lap Belt adjusting hardware to eliminate slippage.

Prototype lap belts have been built and we should be mocking these up with our pilots this week in order to determine if they are usable or not.

R. Improve flotation garment lanyard knob.

The best suggestion to a solution to this problem is to use a light weight plastic golf ball as a knob. We will make two other knobs and provide them to [] for evaluation, one is to be per our drawing and the second is to be a light weight "T" handle type.

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[] is to look into attaching the cover and the knob together such that when the cover is pulled off you will have the knob in the pilot's hand so that he can continue that action to fire the CO₂ bottle.

S. Improve visor up-lock for water survival situations.

[] is to check the up-lock function and to determine whether or not it is practical to make it stiff enough to keep the visor up during the water survival situation. As an interim measure the mike is to be swung out beyond the frame of the helmet in order to block open the face visor when it does come down and to provide good water drainage from the helmet during water entry.

II. SURVIVAL KIT DEPLOYMENT

A. Provide automatic ruck sack and lanyard for all pilots.

We are to send a wire to [] asking him to standardize the Lockheed pilot survival kits and to be sure that they have all of the latest developments incorporated in them. This is to include such things as the new kit operated lanyard device, "D" ring incorporation for lanyard attachment, etc.

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[] stated he would provide the automatic ruck sack and other devices for our pilots upon receiving such authorization.

B. Mount beacon so that it can be used after parachute harness is discarded.

The ART 21 beacon is to be mounted to the oxygen pan with quick disconnect so that the pilot can remove it and use it after landing.

The ART 21 is to be supplanted by the ART 27 as soon as possible and it also is to be made removable as above.

C. Add automatic deployment feature to survival kit which will also inflate present raft and ruck sack.

To accomplish this feature, [] is to send four kits to [] for incorporation of automatic deployment. The work with [] will be contracted with Firewel and [] here will monitor for Firewel. We will contact [] and be certain that the automatic deployment features are completely compatible with ejection seats.

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This feature as incorporated will ensure that the kit always separates at 5,000 feet altitude and the pilot is to have no over-ride function to stop such separation.

[] people have developed a means to provide pilot option in the case of raft inflation. This is obtained by means of a nylon tube surrounding the nylon cord that normally inflates the raft which is incorporated by his technicians if the mission demands it. This provides that the raft will be separated from the seat pan

and hanging on the tube in an uninflated condition; the pilot can then reach and pull on the cord if he so desires and inflate the raft at his option.

- D. Modification of attachment so that raft and kit are attached to pilot prior to take-off.

25X1 [] is making this modification to the kits and it will be incorporated on the present kits for all pilots and on the four kits which are to have the automatic deployment feature incorporated.

The line to the raft is to be colored red in order to distinguish it from the other parachute riser lines in the water.

III. RAFT IMPROVEMENTS

- A. Present raft should have handles added to the top to improve access and boarding.

It is felt that the handles on the rafts as we now have them configured at [] are sufficient. The raft used by [] was not up to the latest configuration. It is important that such things used by the Lockheed pilots are made to the best configuration possible as stated above.

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- B. Modify raft to open ended configuration at foot end to study improved boarding capabilities.

25X1 [] has been working on this and will have it ready to try on 15 November.

- C. Develop an automatic life raft boarding system which will place an incapacitated pilot in the raft with no effort on his part.

We will continue development work on this automatic life raft boarding system in terms of making it more reliable and making a smaller package which will take up less space in the survival kit. It is felt that even though it will take up more survival kit space than the present raft, this will be very desirable to have on some particular missions wherein it is obvious that water survival is the most important. With this in mind we should probably plan on having

one-half dozen of such kits available for missions that are primarily concerned with over water routes.

Since there are many items above that require mock-up development work on the pressure suit, it is planned to have [] use one of the two suits that we presently have for this work. We will send [] complete salt water suit back to [] to continue this development work.

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Best regards,

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